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| (54) Title: DETERRENT FOR SMALL ANIMALS AND/OR BIRDS | | |
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| (57) Abstract <p>A deterrent means for deterring the presence of small animals, birds and the like includes elongate insulating material (2), housing at least two laterally spaced apart lengths of partially exposed wire (3, 4), one being live and connected to a source of power (5), the other being connected to earth. A plurality of spaced apart openings (6) are provided along the length of said deterrent means, between said laterally spaced apart wires (3, 4) for drainage. The arrangement of the invention is such that on a small animal coming into contact with the wires (3, 4), a circuit is completed and a current is conducted through the small animal or bird, thus discouraging its presence.</p> | | |

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DETERRENT FOR SMALL ANIMALS AND/OR BIRDS

BACKGROUND TO THE PRESENT INVENTION

This invention relates to a deterrent means for deterring animals, and in particular small animals, birds and the like from resting or residing in places where their presence is undesirable or not required. While reference is made throughout the specification and claims, to animals and birds, it should be appreciated that this term covers all animals, birds, mice, reptiles, rodents, snails and some insects (such as for example cockroaches, spiders and the like). In particular, the invention relates to a deterrent arrangement for deterring small animals and birds from resting or residing in areas where their presence is undesirable or not required.

As will be appreciated, in many circumstances, there is a need and requirement to prevent or discourage small animals and/or birds from entering into, or resting or residing in certain places. For example, it is often necessary to prevent or deter small animals or birds from entering homes, buildings, barns and the like or for example, resting on rails, fences and the like.

By way of example only, it is often desirable to prevent or deter the presence and entry of small animals such as possums, rodents and the like from the roofs of buildings or sheds. Further, in many cases, it is desirable to prevent or deter birds from resting on fences, clothes-lines, window ledges and the like where they might cause a nuisance by reason of their droppings, noise or general defacing of the structure upon which they rest.

Many different methods and arrangements have been disclosed in an attempt to deter small animals and/or birds from

creating a nuisance of themselves in this way. For example, traps have been set or poisons deposited in the roofs of houses or in barns, while in many cases, paste and other sticky substances have been spread along fences and gutters in order to prevent or deter the presence of small animals and/or birds.

However, the known methods and means disclosed and used up until this time have had many disadvantages associated therewith and have not always been effective. By way of example, in many cases, while pastes and other sticky substances can be useful for temporarily deterring the presence of small animals and/or birds, they can also provide a nuisance to humans and detract from the aesthetic appearance of structures, fences, railings or the like. Poisons, shooting and traps are often effective for eliminating and deterring the presence of small animals or birds, but can often be considered as more of a cure than a prevention. Further, poisons and traps can often be harmful to small animals and/or birds. It should be appreciated that while it is desirable to be able to deter the presence of small animals and/or birds, it is not always desirable and necessary to eliminate and/or harm such small animals and birds.

It is an object of this invention to go at least some way towards overcoming or minimising problems associated with known methods and means for deterring the presence of small animals and/or birds.

It is a further object of this invention to provide deterrent means for use in deterring the presence of small animals and/or birds which are straightforward and efficient.

Other objects of this invention will become apparent from

the following description.

SUMMARY OF THE PRESENT INVENTION

According to one aspect of this invention, there is provided a deterrent means for deterring the presence of small animals or birds, including elongate insulating material housing at least two laterally spaced apart lengths of partially exposed wire; one of said wires being a live wire connected to a power supply and a second wire being connected to earth; a plurality of spaced apart openings being provided along the length of said deterrent means, between said laterally spaced apart wires; the arrangement being such that when a small animal or bird contacts both said wires, an electrical circuit is completed, thus causing a current to be conducted through said small animal or bird.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

This invention will now be described by way of example only and with reference to the accompanying drawings, wherein:

FIGURE 1: is a perspective diagrammatic view of a deterrent means in accordance with one preferred form of the present invention,

FIGURE 2: is a perspective diagrammatic view of a deterrent means in accordance with a further form of the present invention,

FIGURE 3: is a perspective diagrammatic view of a deterrent means according to a further form of the present invention, and

FIGURE 4: is a perspective diagrammatic view of a deterrent means according to a further form of the present

invention.

DESCRIPTION OF PREFERRED EMBODIMENTS OF THE PRESENT
INVENTION

This invention will now be described by way of example only, with reference to the accompanying drawings, and it should be appreciated that modifications and improvements may be made to the invention without departing from the scope thereof.

The present invention preferably includes elongate insulating material such as an appropriate plastic or other insulating material. The elongate insulating material can be a single length of material, or alternatively can be two lengths of material joined by spaced apart transverse connecting means, or alternatively can be for example an elongate length of a mesh material formed of insulating material such as plastics and the like. It should be appreciated however, that any appropriate insulating material, or material having insulating properties, is appropriate for use in connection with the present invention.

The elongate insulating material of the present invention houses and locates at least two elongate and laterally spaced apart lengths of wire, one wire being connected to a power supply and the other wire being connected to earth. The wires are housed in the insulating material, so that they are at least partially exposed (for example on the upper surface thereof), so that part of the wire is held within the insulating material, while part of the wire is exposed. Thus, when one wire is attached to a source of electrical power, and a small animal or bird comes into contact with both wires, a shock in the form of a current will be conducted through the small animal or bird, thus

detering its presence in future or repeated presence.

In a preferred form of this invention, the power supply may comprise an energiser or battery; for example, an energiser such as may be found in use with an electrical fence. It should be appreciated however, that any appropriate form of power supply can be used. If desired, a transforming arrangement or means is provided to create a sufficiently high voltage for deterring the presence of small animals and/or birds. In one form of the present invention, appropriate pulsing means can be provided in association with the power supply and/or transformer, so that the power will pulsate through the wire rather than remaining constant.

In one preferred form of the present invention, the insulating material includes one or more openings extending between the elongate electrical wires, so that when in use and in place, water will not sit between the spaced apart wires. As will be appreciated, if water is allowed to collect on the insulating material, between the laterally spaced apart elongate wires, the water will act as a conductor and if allowed to span the two wires, an electrical circuit could be caused to short. Thus, the presence of water between and about the elongate wires of the present invention will substantially detract from the efficiency in operation of the invention. It is therefore important that means be provided between the wires, so as to prevent or minimise water remaining or being held therebetween.

Thus, in preferred forms of the invention as described herein and as illustrated in the accompanying drawings, means are provided for allowing for the drainage of water from between the wires, such drainage means taking a number of different forms. For example, an elongate strip of

insulating material can be provided with a plurality of spaced apart openings extending along the length thereof and between the wires. Such openings can be regular or random openings, of any desired shape and configuration, which are longitudinally and/or randomly spaced apart along the length of the insulating material. Alternatively, the insulating material can be a length of insulating material of a generally mesh form, so that mesh extends between the longitudinally extending and laterally spaced apart wires. In a further form of the invention, it is envisaged that randomly cut, punched or moulded holes or openings of any desired configuration can be provided, extending along the length of the strip of insulating material to allow for the drainage of excess water from between the longitudinally extending and laterally spaced apart wires.

In yet another form of the present invention, each wire can be moulded or formed into a separate elongate strip of insulating material so as to be partially exposed. The elongate strips are laterally spaced apart by a plurality of longitudinally spaced apart transverse connectors which are provided and connected between the strips so as to hold the strips apart while at the same time defining longitudinally spaced apart openings therebetween. The transverse connectors can be connected to the strips by any appropriate connecting means, adhesive, clips or the like.

Referring now to Figure 1 of the accompanying drawings, the insulating strip includes a strip of plastic material 2, which is formed or moulded with two spaced apart wires 3,4. The wires 3,4 are moulded or partially embedded in the strip of insulating material 2, so that the lower portions thereof are held within the strip, while upper parts thereof are partially exposed on the upper surface of the strip 2.

At one end of the strip 2, the wires extend outwardly

therefrom and at least one wire 3 (the "live" wire) is adapted to be connected to a power supply 5. As discussed hereinbefore, in one preferred form of the invention, the power supply 5 is an energiser which may be associated with appropriate pulsing means, such as used in connection with electric fences. However, the energiser can be in the form of a battery or any other appropriate energiser or power supply, should this be desired. Further, if desired, a transformer may be used to convert a relatively low voltage power supply (for example 12 volts) to a suitably higher voltage for the purpose of the present invention.

As shown in the accompanying drawings, the wires 3,4 are preferably laterally spaced apart one from the other and extend longitudinally of, and at least partially within, the strip 2. The wires 3,4 are laterally spaced apart by a distance so that there is a good likelihood of small birds and animals coming into contact with both wires substantially simultaneously. For example, the wires 3,4 are laterally spaced apart by a distance so that the feet and/or bodies of small animals or birds will come into contact with both wires 3,4 at substantially the same time.

In one form of the invention, and by way of example only, the distance between the wires 3,4 is preferably less than the size of a foot of a bird and/or small animals such as a possum or the like. This will enable the foot of a bird and/or possum and the like to complete a circuit and to cause a shock to pass through the bird and/or possum, so as to deter its future presence.

In the form of the invention shown in Figure 1 of the accompanying drawings, a plurality of openings 6 are provided along the length of the strip 2, between the laterally spaced apart wires 3,4. The openings 6 can be of any appropriate configuration and shape and provide openings

or holes for drainage, so that water will not collect on the strip 2, between the laterally spaced apart wires 3,4.

It should also be appreciated that the portions 7 of strip 2, extending between and about the openings 6 between the elongate wires 3,4 can be used for adhering or securing the strip to an appropriate surface. Likewise, outer side edges 8 of the strip 2 can be used for securing the strip to any desired surface, article or the like.

Referring to Figure 2 of the accompanying drawings, it will be seen that the elongate strip 2 is formed with a mesh material, extending at least between elongate wires 3,4 which extend longitudinally of the strip 2 and which are laterally spaced apart. The mesh between the laterally spaced apart wires 3,4 allows for drainage and the removal of any excess water from between the laterally spaced apart wires 3,4. If desired, the strip 2 can be substantially formed of an insulating mesh, also mounting the partially exposed wires 3,4.

Referring now to Figure 3 of the accompanying drawings, a further form of the invention is shown where laterally spaced apart lengths of partially exposed wires 3,4 are located in respective side portions 2a of a strip 2, the side portions 2a being integrally joined one to the other by longitudinally spaced apart and laterally extending connectors 9, which define longitudinally spaced apart openings 6 therebetween for drainage purposes. In use, the connectors 9 can be used for securing the insulating strip 2 to a surface or desired article.

Further, as shown in Figure 3 of the accompanying drawings, the transverse connectors 9 can have a raised and substantially convex surface, so as to essentially form transversely extending "humps", this further allowing for

drainage and preventing and at least minimising the settling of water. In a further form of the invention the connectors 9 can be angled, or bevelled, or otherwise profiled, to allow for water 'run-off' and to avoid the settling of water. If desired however, the connectors 9 can be flat or planar.

Referring further to Figure 3 of the accompanying drawings, in this form of the invention, one or both side portions 2a of the strip 2 can be angled, curved, or sloped downwardly from the location of the wires 3,4 toward one or both side edges 2b of the side portions 2a. Again, this will allow for the "run-off" of water and will avoid or minimise the settling of water such as to interfere with the effective operation of the present invention.

In a further form of the invention, and as shown in Figure 4 of the accompanying drawings, wires 3,4 can be formed or moulded into separate elongate strips 10 and 11, which can be separately moulded and formed. Further, a plurality of transverse connectors such as connector strips 15 can be provided and can be connected to and extend between laterally spaced apart strips 10 and 11, so that the strips 10 and 11 and wires 3,4 are held, laterally spaced apart relative to each other, with a spacing therebetween. The transverse connector strips 15 are longitudinally spaced apart along the length of and between the strips 10 and 11, preferably extending substantially transverse to the longitudinal axes of the strips 10 and 11. The spaced apart connectors 15 thus form openings 6 therebetween which assist for drainage purposes. The connectors 15 can be connected to the strips 10 and 11 by clips, adhesive, bonding or the like. Any other appropriate means of connection can also be used. If desired, the connectors 15 can be formed and profiled such as the connectors 9 described with reference to Figure 3 of the accompanying drawings. Likewise, the

strips 10 and 11 can be formed and profiled such as the strips 2 and side portions 2a thereof, as described with reference to Figure 3 of the accompanying drawings. The arrangement described with reference to Figure 4 of the accompanying drawings allows for the separate integers to be formed and moulded and to be thereafter connected together for use.

In various forms of the invention, the various integers can be integrally formed or moulded, or can be separately formed or moulded, to be attachable and/or engageable or releasably engageable, one with the other.

It should be appreciated that the insulating strip of the present invention is able to be easily secured or attached to fence post, railings, beams, surfaces and the like, by means of adhesives, nails, screws and any other appropriate means of attachment. It should also be appreciated that the invention can also be used on a ground surface, such as to deter small animals or birds or dogs or the like from entering or leaving certain defined areas. If desired, it could also be used on trees to prevent animals from climbing trees. It is also envisaged that the invention could be attached to marine craft and boats, such as for example to prevent or minimise small animals and/or birds from landing on (and possibly fouling) marine craft or boats.

In use, the elongate insulating strip 2 of the present invention is attached to an appropriate post, fence, rail or the like, or is placed on the ground, with the wire 3 being attached to a power source 5. The wire 4 is earthed. On a small animal and/or bird coming into contact with the strip 2 and with both wires 3,4 (such as by spanning the wires 3,4), a circuit is set up causing a current to flow from the power supply through the live wire 3, through the animal or bird (giving same an appropriate shock) and subsequently to

earth. The circuit thereby completed comprises a sufficient voltage to cause an unpleasant sensational shock to the bird and/or small animal, to act in deterring the small animal and/or bird from remaining in its position and to deter it from further presence.

It should be appreciated that the present invention has been described by way of example only and that improvements and modifications may be made to the invention without departing from the scope thereof as defined by the appended claims.

THE CLAIMS DEFINING THIS INVENTION ARE AS FOLLOWS:

1. A deterrent means for deterring the presence of small animals and/or birds, including elongate insulating material housing at least two laterally spaced apart lengths of partially exposed wire; one of said wires being a live wire connected to a power supply and a second wire being connected to earth; a plurality of spaced apart openings being provided along the length of said deterrent means, between said laterally spaced apart wires; the arrangement being such that when a small animal and/or bird contacts both said wires, an electrical circuit is completed, thus causing a current to be conducted through said small animal and/or bird.
2. A deterrent means as claimed in claim 1, wherein said openings are longitudinally spaced apart, one from the other between said laterally spaced apart wires.
3. A deterrent means as claimed in claim 1, wherein a plurality of randomly located holes or openings are formed or provided in insulating material between said laterally spaced apart wires.
4. A deterrent means as claimed in claim 1, including two laterally spaced apart strips of insulating material, each strip housing at least one length of partially exposed wire; said spaced apart strips being connected one to the other, by a plurality of longitudinally spaced apart, transverse, connectors; a plurality of spaced apart openings being formed therebetween and between said laterally spaced apart strips of insulating material.
5. A deterrent means as claimed in claim 4, wherein said

transverse connectors have an upper convex or angled profile.

6. A deterrent means as claimed in claim 1, including transverse connectors extending between said wires, so as to form said spaced apart openings; said transverse connectors having an upper convex or angled profile.
7. A deterrent means as claimed in any one of the preceding claims, wherein said insulating material is angled, slopes, or is profiled, downwardly and away from, said lengths of partially exposed wire, towards one or more outer side edges of said insulating material.
8. A deterrent means as claimed in claim 1, wherein said insulating material includes a mesh material at least extending between said laterally spaced apart wires.
9. A deterrent means as claimed in claim 4, wherein separate wires are moulded into strips of insulating material; said transverse connectors being connected to and between said separate strips of insulating material.
10. A deterrent means as claimed in claim 4, wherein said strips of insulating material and said transverse connectors are integrally formed one with the other.
11. A deterrent means as claimed in any one of the preceding claims, wherein said insulating material is a plastic material.

1/4

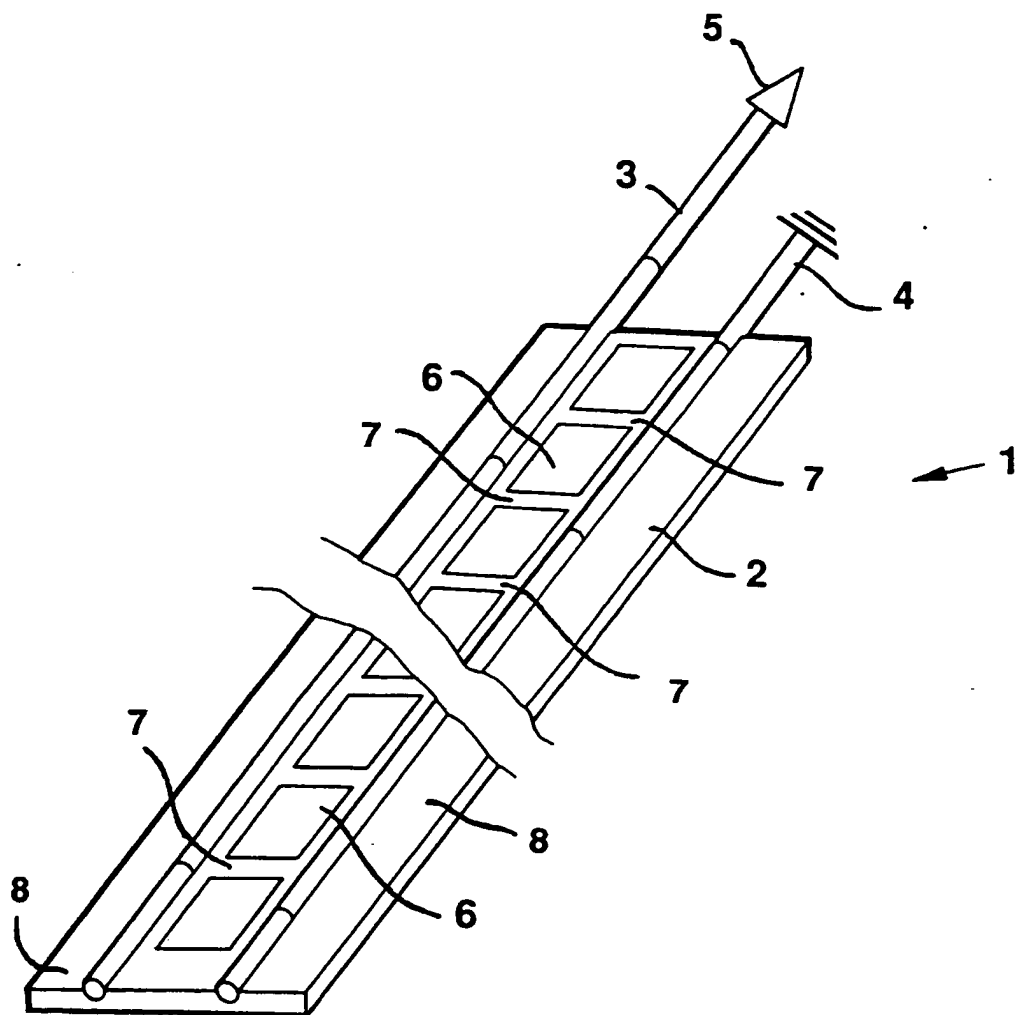


FIGURE 1

2/4

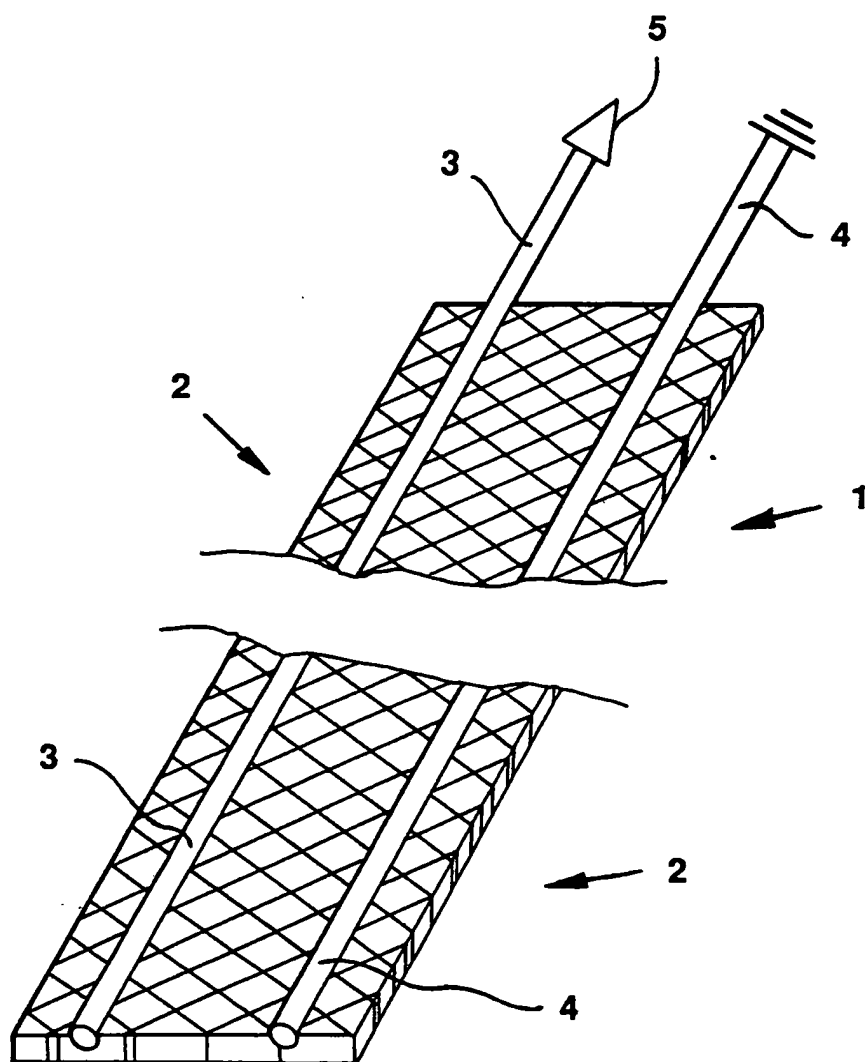


FIGURE 2

3/4

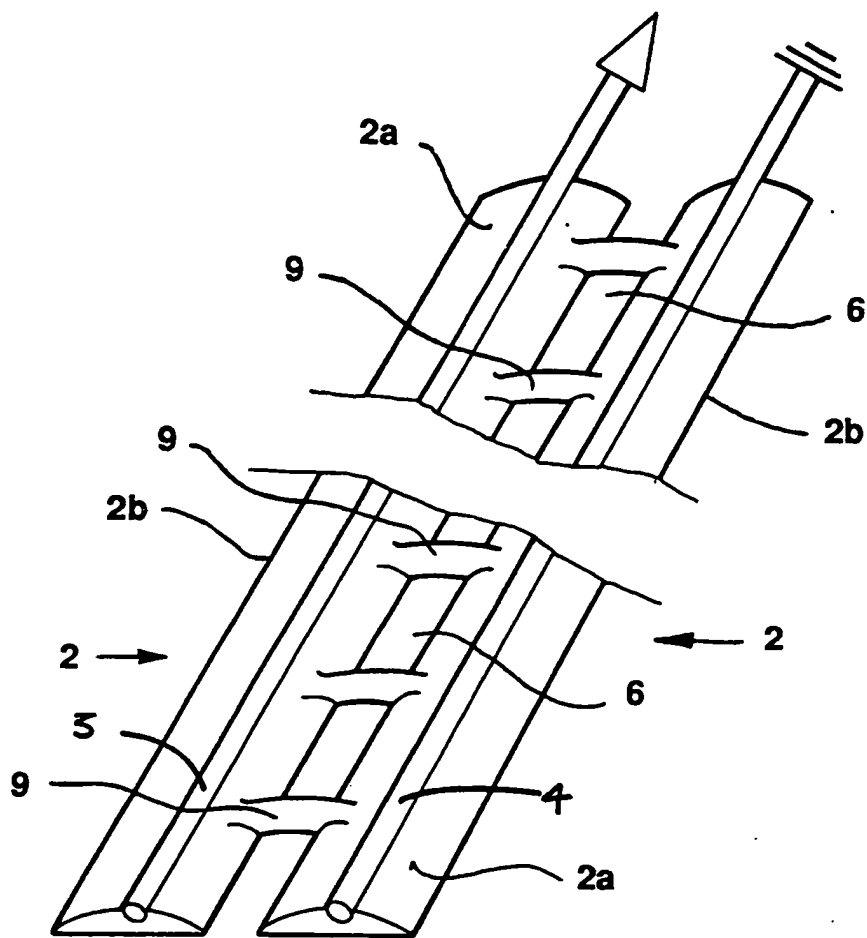


FIGURE 3

4/4

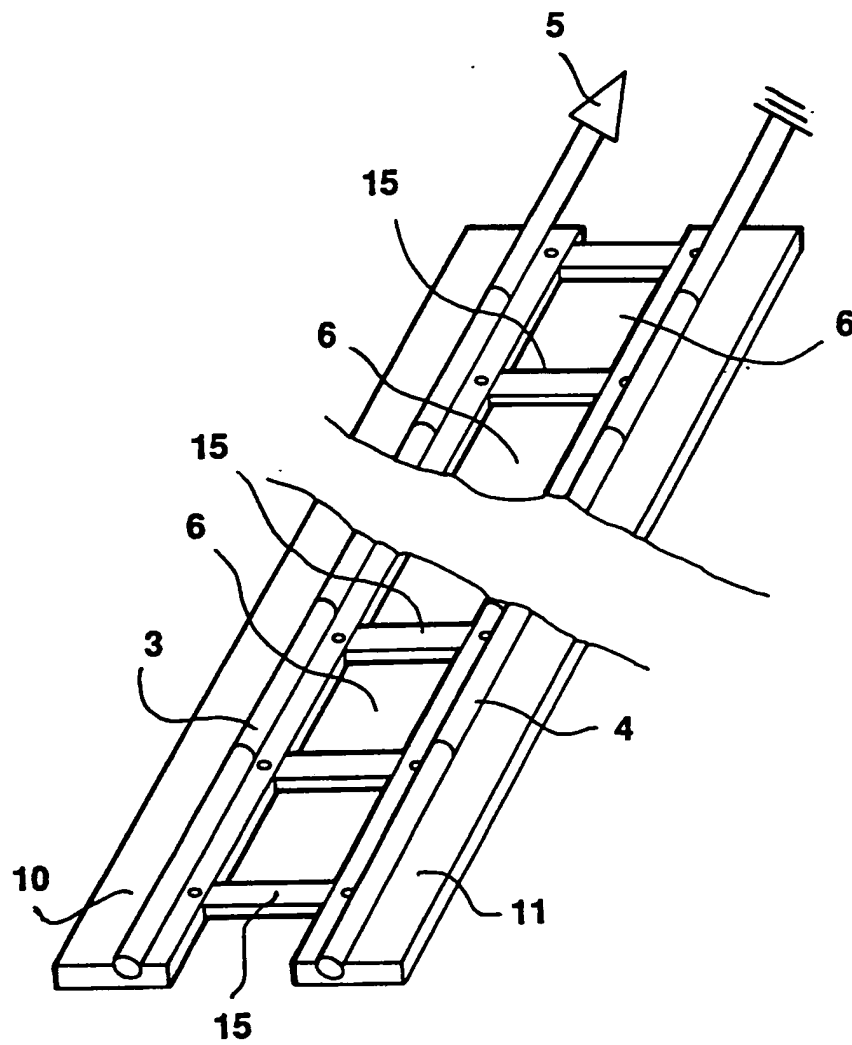
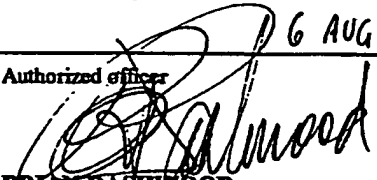


FIGURE 4

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| A. CLASSIFICATION OF SUBJECT MATTER Int. Cl. ⁵ A01M 29/00, A01K 03/00, H05C 01/00, 01/02, 01/06 According to International Patent Classification (IPC) or to both national classification and IPC | | | | |
| B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC A01M 29/00, H05C 01/06 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU : IPC as above Electronic data base consulted during the international search (name of data base, and where practicable, search terms used) | | | | |
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| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to Claim No. | | |
| X Y | EP,A, 328866 (WALDHOFF) 23 August 1989 (23.08.89) Whole document | 1-8,11 9,10 | | |
| X Y | DE,A, 4138514 (SUZEN) 16 April 1992 (16.04.92) Whole document | 1-8,11 9,10 | | |
| X Y | DE,A, 3914894 (SEIPP) 12 October 1989 (12.10.89) Whole document | 1-4,11 5-10 | | |
| <div style="display: flex; justify-content: space-between;"> <div> <input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. </div> <div> <input checked="" type="checkbox"/> See patent family annex. </div> </div> | | | | |
| <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </td> <td style="width: 50%; vertical-align: top;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> </td> </tr> </table> | | | <p>* Special categories of cited documents :</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p> |
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| Date of the actual completion of the international search 23 July 1993 (23.07.93) | | Date of mailing of the international search report 6 AUG 1993 (6.08.93) | | |
| Name and mailing address of the ISA/AU AUSTRALIAN INDUSTRIAL PROPERTY ORGANISATION PO BOX 200 WODEN ACT 2606 AUSTRALIA Facsimile No. 06 2853929 | | Authorized officer  BRIAN DASHWOOD Telephone No. (06) 2832121 | | |

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|---|-----------------------|
| Category* | Citation of document, with indication, where appropriate of the relevant passages | Relevant to Claim No. |
| X | GB,A1, 2220122 (CONTECH ELECTRONICS INC) 4 January 1990 (04.01.90) Pages 4-5, Claim 1, Figure 1 | 1-3,11 |
| X Y | US,A, 5096162 (CLEVELAND) 17 March 1992 (17.03.92) Column 1 line 44 to Column 3 line 13, Claim 1, Figure 1 | 1-3,11 4-10 |
| X Y | AU,A, 16890/70 (BROCK) 6 January 1972 (06.01.72) Page 2 line 26 to Page 3 line 12, Claims 1 to 8, Figure 7 | 1-8,11 9,10 |
| Y | DE,A, 3930013 (WINDHAGER TRADING) 14 March 1991 (14.03.91) Whole document | 9,10 |
| A | DE,A, 3935340 (FUNDUS) 26 April 1990 (26.04.90) | |

INTERNATIONAL SEARCH REPORT

International application No.

PCT/au 93/00167

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

| Patent Document Cited in Search Report | | Patent Family Member | |
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| EP | 328866 | DE | 3800716 |
| DE | 3914894 | EP | 372564 |
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